3.10 Noise

This section evaluates the potential effect of the proposed Pacifica General Plan on noise levels within the Planning Area. It describes how noise is measured and regulated, and identifies sources of noise in Pacifica.

Environmental Setting

PHYSICAL SETTING

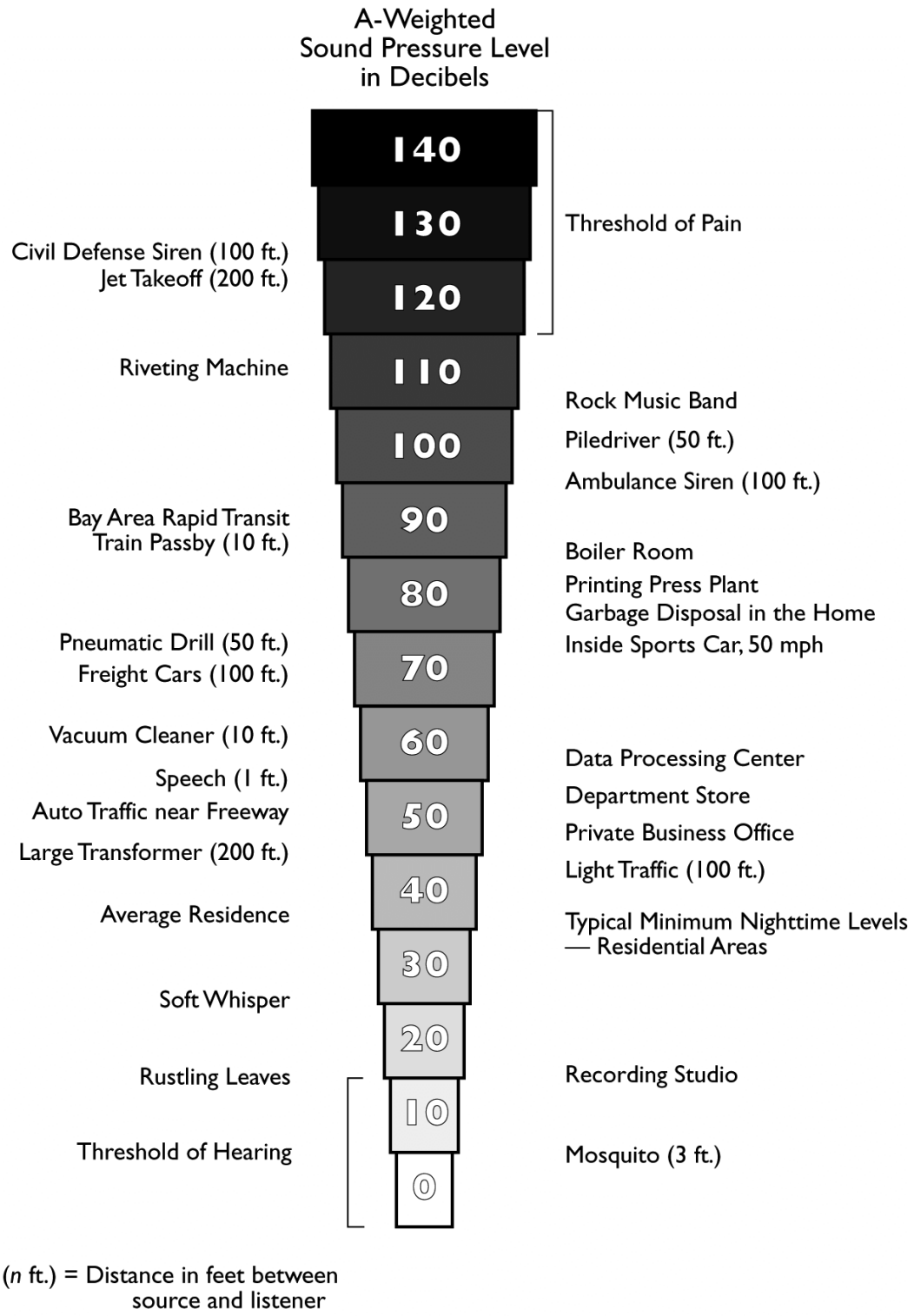
Noise Descriptors

Sound waves, traveling outward from a source, exert a sound pressure level (commonly called "sound level"), measured in decibels (dB). In general, people can perceive a two- to three-dB difference in noise level; a difference of 10 dB is perceived as a doubling of loudness. "Noise" is often defined as unwanted sound. Environmental noise is usually measured in A-weighted decibels, a metric corrected for the variation in frequency response of the human ear. The A-weighted scale is used to describe all noise levels discussed in this section.

Environmental noise levels typically fluctuate over time; different types of noise descriptors are used to account for this variability. Some descriptors characterize cumulative noise over a given period, while others describe single noise events. Cumulative noise descriptors include the energy-equivalent noise level (Leq), Day-Night Average Noise Level (DNL), and Community Noise Equivalent Level (CNEL). The Leq is the actual time-averaged, equivalent steady-state sound level, which, in a stated period, contains the same acoustic energy as the time-varying sound level during the same period. Some representative noise sources and their corresponding A-weighted noise levels are shown in **Figure 3.10-1**.

DNL and CNEL values result from the averaging of Leq values (based on A-weighted decibels) over a 24-hour period, with weighting factors applied to different periods of the day to account for their greater relative annoyance. For DNL, noise that occurs during the nighttime period (10:00 p.m. to 7:00 a.m.) is penalized by 10 dBA. The CNEL descriptor is similar to DNL, except that it also includes a penalty of approximately 5 dBA for noise that occurs during the evening period (7:00 p.m. to 10:00 p.m.). The cumulative noise descriptors, DNL and CNEL, are well correlated with the likelihood of public annoyance from transportation noise sources.

Figure 3.10-1: Typical Sound Levels



Sound Propagation and Attenuation

Sound level naturally decreases as one moves farther away from the source. This basic attenuation rate is referred to as the geometric spreading loss. The basic rate of geometric spreading loss depends on whether a given noise source can be characterized as a point source or a line source. For a point source, such as an idling truck or jackhammer, the noise level decreases by about 6 dBA for each doubling of distance away from the source.

In many cases, noise attenuation from a point source increases by 1.5 dBA from 6.0 dBA to 7.5 dBA for each doubling of distance due to ground absorption and reflective wave canceling. These factors are collectively referred to as excess ground attenuation. The basic geometric spreading loss rate (6.0 dBA per doubling of distance) is used where the ground surface between a noise source and a receiver is reflective, such as parking lots or a smooth body of water. The excess ground attenuation rate (7.5 dBA per doubling of distance) is used where the ground surface is absorptive, such as soft dirt, grass, or scattered bushes and trees.

For a line source, such as a heavily traveled roadway, the noise level decreases by a nominal value of 3.0 dBA for each doubling of distance between the source and the receiver. If the ground surface between source and receiver is absorptive rather than reflective, the nominal rate increases by 1.5 dBA to 4.5 dBA for each doubling of distance. Atmospheric effects, such as wind and temperature gradients, can also influence noise attenuation rates from both line and point sources of noise. However, unlike ground attenuation, atmospheric effects are constantly changing and difficult to predict.

Trees and vegetation, buildings, and barriers reduce the noise level that would otherwise occur at a given receptor distance. However, for a vegetative strip to have a noticeable effect on noise levels, it must be dense and wide. For example, a stand of trees must be at least 100 feet wide and dense enough to completely obstruct a visual path to the roadway to attenuate traffic noise by 5 dBA.[1] A row of structures can shield more distant receivers depending upon the size and spacing of the intervening structures and site geometry. Generally, for an at-grade highway in an average residential area where the first row of houses cover at least 40 percent of the total area, the reduction provided by the first row of houses is approximately 3 dBA, there is 1.5 dBA of additional reduction for each additional row of homes.[2] Similar to vegetative strips discussed above, noise barriers, which include natural topography and sound walls, reduce noise by blocking the line of sight between the source and receiver. Generally, a noise barrier that breaks the line of sight between source and receiver will provide at least a 5 dBA reduction in noise.

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[1] California Department of Transportation, October 1998.

[2] *Ibid.*

Effects of Noise

The effects of noise on humans may include annoyance, interference with various activities, hearing loss, and stress-related health problems. These effects of noise are discussed below.

- **Annoyance** is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capability (for instance, some people like the sound of trains, while others do not).
- **Speech interference** is one of the primary concerns associated with environmental noise. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. Depending upon the distance between the talker and the listener, background noise levels may require a raised voice in order to communicate. Transportation sources can easily interfere with conversation within a few hundred feet of the source.
- **Sleep interference** is a major noise concern related to traffic-generated noise. Sleep disturbance studies have identified interior noise levels attributed to traffic noise as a key factor of sleep disturbance. However, it should be noted that sleep disturbance does not necessarily mean awakening from sleep, but can refer to altering the pattern and stages of sleep. Train noise (especially horn soundings) is a major source of complaints.
- **Potential hearing loss** is commonly associated with occupational exposures in heavy industry or very noisy work environments. Noise levels in neighborhoods, even near very noisy airports, are not sufficiently loud to cause hearing loss.
- **Physiological responses** are those measurable noise effects on the human metabolism. They are ascertained as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent to which these physiological responses cause harm or are a sign of harm is not known.

Vibration

Vibration is energy radiated through the ground. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. Sources of groundborne vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as the passing of a train.

The effects of groundborne vibration include perceptible floor movement, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In contrast to noise, vibration is not a common environmental problem. In extreme cases, vibration can cause damage to buildings. Building damage is usually not a factor for normal transportation projects, with the exception of blasting and pile driving during construction. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Annoyance from vibration often occurs when the vibration exceeds the

threshold of human perception by only a small margin. A vibration level that causes annoyance will be well below the damage threshold for normal buildings.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise than others. Places where people sleep, where people require quiet for focused concentration, and where people receive medical and nursing care are all likely to be sensitive receptor locations. These uses include, but are not limited to, residences, motels, hotels, schools, libraries, churches, auditoriums, hospitals, nursing homes, natural areas, parks, and outdoor recreation areas. Consequently, the noise standards for these land uses are more stringent than those for less sensitive uses such as commercial, office, or industrial land. Sensitive receptors of all types are located within Pacifica.

To protect various human activities in sensitive areas (e.g., sleeping, studying, recuperating), lower noise levels are generally required. For example, a maximum outdoor noise level of 55 to 60 DNL is necessary for intelligible speech communication inside a typical home. Social surveys and case studies have shown that complaints and community annoyance in residential areas begin to occur when outdoor noise reaches 55 DNL. Sporadic complaints associated with the 55 to 60 DNL range give rise to widespread complaints within the 60 to 70 DNL range. At 70 DNL and above, residential community reaction typically involves threats of legal action and strong appeals to local officials to stop the noise.

Operational Noise Sources

Noise levels in Pacifica vary considerably, as indicated in **Figure 3.10-2** that depicts existing noise in the City. Principal noise sources in Pacifica include freeway and arterial roadways and the City's proximity to San Francisco International Airport. Residential neighborhoods are dominated by local traffic sounds and other human activities such as lawn mowing, leaf blowing, and music. Along major streets and freeways, the sound of traffic grows more intense because traffic levels and speeds are higher, and trucks make up a greater share of the traffic. Other noise sources include those associated with service commercial uses such as automotive repair facilities, car washes, and recycling yards. Noise as a result of construction is another substantial source, though often short-term.

Freeways and Major Arterial Roadways

Most noise within Pacifica is from automobile and truck traffic. Vehicle traffic background noise levels vary throughout the day based on the average density of noise sources in a given area. Traffic noise at a particular location depends upon the traffic volume on nearby roadways, the average vehicle speed, distance between the receptor and the roadway, intervening barriers between source and receiver, and the ratio of trucks (particularly heavy trucks) and buses to automobiles.

The major noise sources in Pacifica from freeways and arterial roadways are a result of vehicle traffic along State Routes 1 and 35 and Sharp Park Road. Noise exposure contours for

Pacifica's major roadways were modeled by applying the Federal Highway Administration's noise modeling procedure. Traffic data representing annual average traffic volumes and truck mix, for existing conditions, were obtained from the engineers working on the General Plan Update and Caltrans. Existing noise measurements were made in March 2009 at four locations, three along SR 1 and one along Sharp Park Road. Using these data and the FHWA methodology, traffic noise levels were calculated for existing traffic volumes.

Based on this analysis, about 1,180 acres or 15 percent of the Planning Area were in areas with traffic noise levels greater than 60 dB (CNEL). These areas include approximately 319 acres designated for medium or low density residential development with community noise levels between 60 and 70 dB, considered "conditionally acceptable" for single-family or townhouse development, and 23 acres of medium or low density land with community noise levels over 70 dB, considered "normally unacceptable." Another 32 acres of high density residential and mixed use land is affected by noise levels of between 65 and 70 dB, considered "conditionally acceptable" for multi-family development, and four acres of land in these categories is currently exposed to unacceptable noise levels over 70 dB. In general, the further development is from Sharp Park Road, SR 35, and especially SR 1, the less noise is likely to be experienced.

Airport Noise

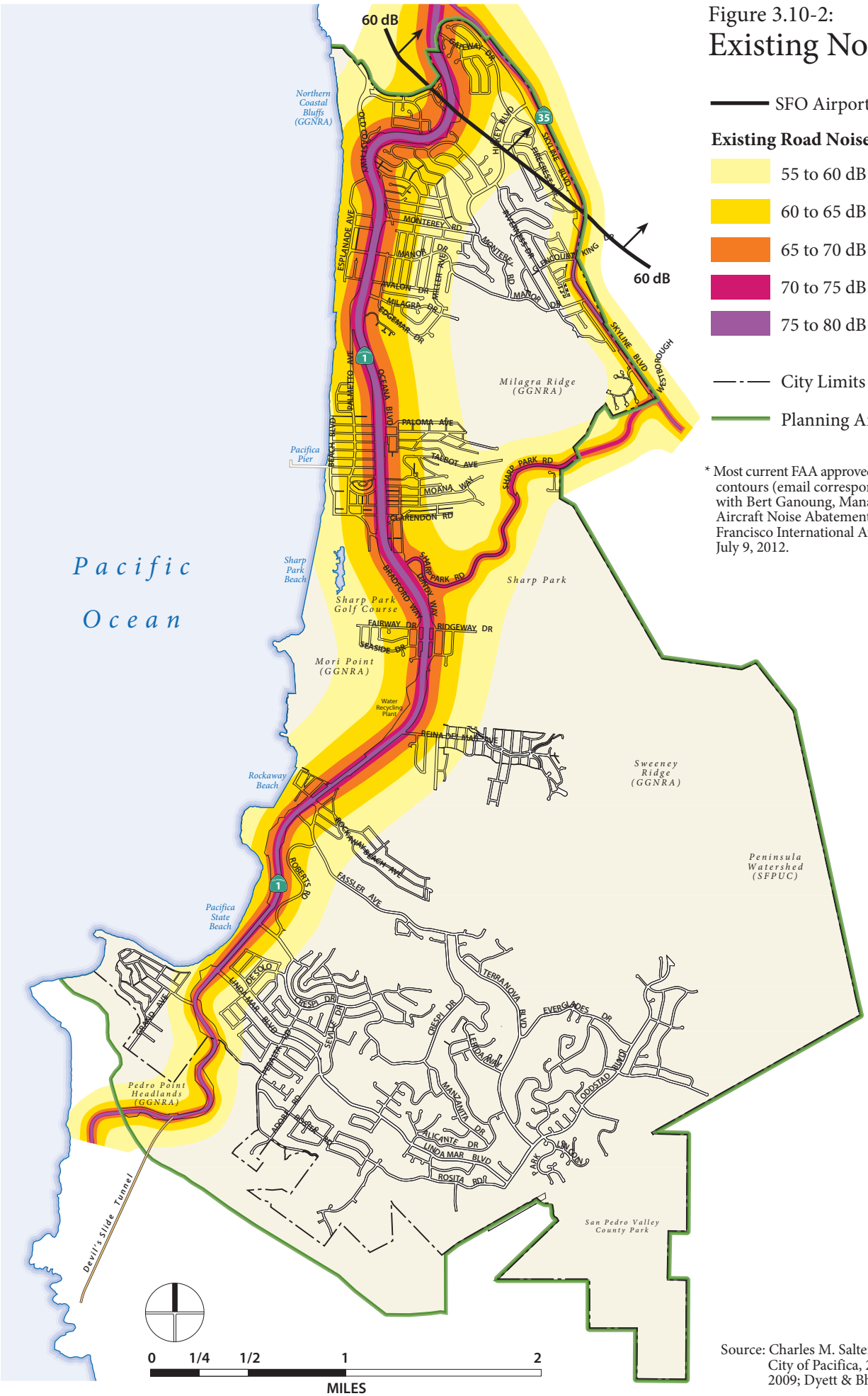
The greatest potential for noise intrusion from airports occurs when aircraft land, take off, or run their engines while on the ground. San Francisco International Airport (SFO) is located approximately four miles east of the Planning Area. Noise contours developed for SFO show noise levels elevated above 60 dB extending over approximately 117 acres in the northeastern corner of the Planning Area, in the Fairmont neighborhood, including 88 acres of residential land.

SFO's Aircraft Noise Abatement Office maintains a noise abatement program that integrates parts of the approved Noise Compatibility Plan; City and County of San Francisco resolutions; stated goals of the San Francisco International Airport/Community Roundtable; and air traffic control requirements. The program includes a mix of regulatory and voluntary actions that together minimize the impacts of noise on communities while ensuring safety.

Construction Noise Sources

Construction is another significant, although typically short-term, source of noise. Construction noise is most significant when it takes place near sensitive land uses, and occurs at night or in early morning hours. Local governments typically regulate noise associated with construction equipment and activities through enforcement of noise ordinance standards, implementation of general plan policies, and imposition of conditions of approval for building or grading permits. **Table 3.10-1** shows typical noise levels associated with various types of construction equipment.

Figure 3.10-2:
Existing Noise



SFO Airport Noise Contours*

Existing Road Noise Levels

- 55 to 60 dB
- 60 to 65 dB
- 65 to 70 dB
- 70 to 75 dB
- 75 to 80 dB

City Limits

Planning Area

* Most current FAA approved NEM contours (email correspondence with Bert Ganoung, Manager, Aircraft Noise Abatement, San Francisco International Aurport, July 9, 2012.

Source: Charles M. Salter Associates, Inc., 2009; City of Pacifica, 2008; San Mateo County, 2009; Dyett & Bhatia, 2013.

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Table 3.10-1: Typical Noise Levels from Construction Equipment

Construction Equipment	*Noise Levels (dBA at 50 feet from source)*
Air Compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile-Driver (Impact)	101
Pile-Driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88

Source: U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, 2006.

REGULATORY SETTING

Federal, State, and local agencies regulate different aspects of environmental noise. Generally, the federal government sets noise standards for transportation-related noise sources closely linked to interstate commerce. These include aircraft, locomotives, and trucks. The State government sets noise standards for other transportation noise sources less closely linked with interstate commerce, such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies. While local general plans identify general principles intended to guide and influence noise from development and systems operation, it is typically noise ordinances that set forth the specific standards and procedures for addressing particular noise sources and activities.

Federal Regulations

Federal regulations for railroad noise are contained in 40 CFR, Part 201 and 49 CFR, Part 210. Noise limits are implemented through regulatory controls on locomotive manufacturers. For locomotives manufactured during or after 1980, noise limits are as follows:

- Stationary locomotives (at idle throttle setting) are not to exceed 70 dBA at 15 meters (approximately 50 feet) from the track pathway centerline;
- Stationary locomotives (at all other throttle settings) are not to exceed 87 dBA at 15 meters; and
- Moving locomotives are not to exceed 90 dBA at 15 meters.

Sounding locomotive horns or whistles in advance of highway-rail grade crossings has been used as a safety precaution by railroads since the late 1880s. The manner in which horns have been sounded (two longs, one short and one long) was standardized in 1938. In response to a growing national trend towards restrictions on the use of locomotive horns under local ordinances and a related increase in collisions, Congress passed the Swift Rail Development Act, which directed the Federal Railroad Administration to develop rules addressing this issue. On December 18, 2003, the Federal Railroad Administration published an Interim Final Rule that requires the use of locomotive horns or whistles when approaching road/rail grade crossing, except in approved quiet zones, where supplementary safety measures have been installed or adopted by the state or locality. The rule establishes that a horn sound level must be a minimum of 96 dBA and no louder than 110 dBA measured 100 feet in front of the locomotive and 15 feet above the rail. The rule became effective on December 18, 2004.[3]

The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline (trucks more than 4.5 tons, gross vehicle weight rating, under 40 CFR, Part 205, Subpart B). This standard is implemented through regulatory controls on truck

[3] Federal Railroad Administration, 2003.

manufacturers. Under regulations established by the Federal Highway Administration, noise abatement must be considered for federal or federally-funded projects involving the construction of a new highway or significant modification of an existing freeway. Abatement is considered when the project would result in a substantial noise increase or when the predicted noise levels approach or exceed the Noise Abatement Criteria (23 CFR Part 772). Under these criteria, a substantial increase is defined as a 12 dBA increase in the Leq during the traffic peak hour. The Noise Abatement Criteria differ among various activity categories and between exterior spaces and interior spaces. For sensitive uses, such as residences, schools, churches, parks, and playgrounds, the Noise Abatement Criteria for interior and exterior spaces during the traffic peak hour is 57 and 67 Leq, respectively.

State Regulations

California Department of Transportation (Caltrans)

Traffic Operations Noise

The California Department of Transportation Traffic Noise Analysis Protocol (Protocol) establishes the policies and procedures to be used in the assessment of traffic noise exposure and impact for new construction and reconstruction projects. The NAC in the Protocol are the same as those presented in 23 CFR 772 (see USDOT/FHWA information above). The Protocol defines a substantial project-related traffic noise level increase when the project's worst-case hour exceeds the ambient worst-case hour by 12 dB or more.

Rail Operations Noise

Caltrans endorses the use of the FTA noise criteria and methodologies for assessing project-related rail noise and vibration impacts.

Construction Noise

As presented in the Protocol, Section 14-8.2, Noise Control, Caltrans standard specifications establishes a construction noise exposure/production limit of 86 dB (Lmax)[4] at a distance of 50 feet. Additionally, this specification establishes that all internal combustion engines should be equipped with manufacturer-recommended mufflers, and that no internal combustion engines may be operated without mufflers.

California Code of Regulations (CCR)

Aircraft Operations

The California Airport Noise Standards, Title 21, Section 5000 et seq. of the California Code of Regulations (CCR) apply to any airport that is deemed to have a "noise problem" as established by the local County Board of Supervisors in accordance with the provisions in the

[4] The highest A-weighted sound level occurring during a noise event.

regulation. Currently, within the Bay Area, Norman Y. Mineta-San José International Airport and San Francisco International Airport have been given this designation. The Standards establish a noise exposure limit "acceptable to a reasonable person residing in the vicinity of an airport" of 65 dB CNEL.

Noise Insulation Standard

The California Noise Insulation Standards found in CCR, Title 24 establish requirements for new multi-family residential units, hotels, and motels that may be subject to relatively high levels of transportation noise. In this case, the noise insulation criterion is 45 dB DNL/CNEL inside noise-sensitive spaces. For developments with exterior transportation noise exceeding 60 dB DNL/CNEL, an acoustical analysis and mitigation (if required) must be provided showing compliance with the 45 dB DNL/CNEL interior noise exposure limit.

Local Regulations

Each county and city in California is required to adopt a Noise Element as part of its General Plan to identify, appraise, and remedy noise problems in the local community. Each Noise Element is required to analyze and quantify, to the extent practicable, current and projected noise levels associated with local noise sources. Beyond statutory requirements, local jurisdictions are free to adopt their own goals and policies in their Noise Elements. However, most jurisdictions chose to adopt noise/land use compatibility policies derived from State recommendations.

City of Pacifica General Plan Noise Element

The existing Pacifica General Plan includes policies and action programs in that are in place to ensure that noise levels in the City are reduced whenever possible. Policies include:

- Working with other agencies, airports, and jurisdictions to reduce noise levels in Pacifica created by their operations.
- Establishing and enforcing emission standards for Pacifica which are consistent with the residential character of the City and environmental, health and safety needs of the residents.[5]

Pacifica Municipal Code Noise Ordinance, Chapter 10: Loud, Disturbing, Unusual, and Unnecessary Noises

Title 5, Chapter 10 of the Pacifica Municipal Code makes it unlawful to cause any "loud, disturbing, unnecessary, or unnatural noise" that disturbs persons in Pacifica, and identifies specific types of noises including vehicle horns and amplifiers. It prohibits the use of pile

[5] City of Pacifica General Plan, 1980.

drivers or similar equipment between 8 p.m. and 7 a.m., and restricts the hours of solid waste collection.

Pacifica Municipal Code Section 5-10.03.

This section of the municipal code states, "It shall be unlawful for any person to make or continue, or cause to be made or continued, any loud, disturbing, unnecessary, or unusual noise or any noise which annoys, disturbs, injures, or endangers the comfort, health, repose, peace, or safety of other persons within the City." Noise disturbances listed under this regulation include:

- Vehicle horns and signaling devices;
- Radios, photographs, musical instruments, and similar devices;
- Loudspeakers, amplifiers, and similar advertising devices;
- Yelling, shouting, and similar noises;
- Animals and birds;
- Steam whistles;
- Exhausts;
- Defective or loaded vehicles;
- Loading and unloading vehicles and opening boxes;
- Construction or repairing buildings and excavating;
- Adjacent to schools, courts, churches, and hospitals;
- Shouting by hawkers and peddlers;
- Pile drivers, hammers, and similar equipment;
- Blowers, fans, and combustion engines;
- Auto body repairs; and
- Solid waste collection.

In addition, Title 5, Chapter 28 defines the terms for regulating loud parties. Chapter 29 requires general disclosure of the existence of the airport and the potential for noise from overflight, for all property in the City. Special disclosure is required for property within the airport's CNEL noise footprint as of 1983.

Impact Analysis

SIGNIFICANCE CRITERIA

Implementation of the proposed General Plan would have a potentially impact if it would:

Criterion 1: Result in a substantial permanent increase in ambient noise levels above levels existing without the project.

Criterion 2: Result in a substantial temporary or periodic increase in ambient noise levels above levels existing without the project.

Criterion 3: Cause the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

Criterion 4: Expose persons to or generate outdoor noise levels in excess of existing standards in the current Pacifica General Plan Noise Element or Noise Ordinance.

Criterion 5: Expose people residing or working in the project area to excessive noise levels as identified in an airport land use plan.

METHODOLOGY AND ASSUMPTIONS

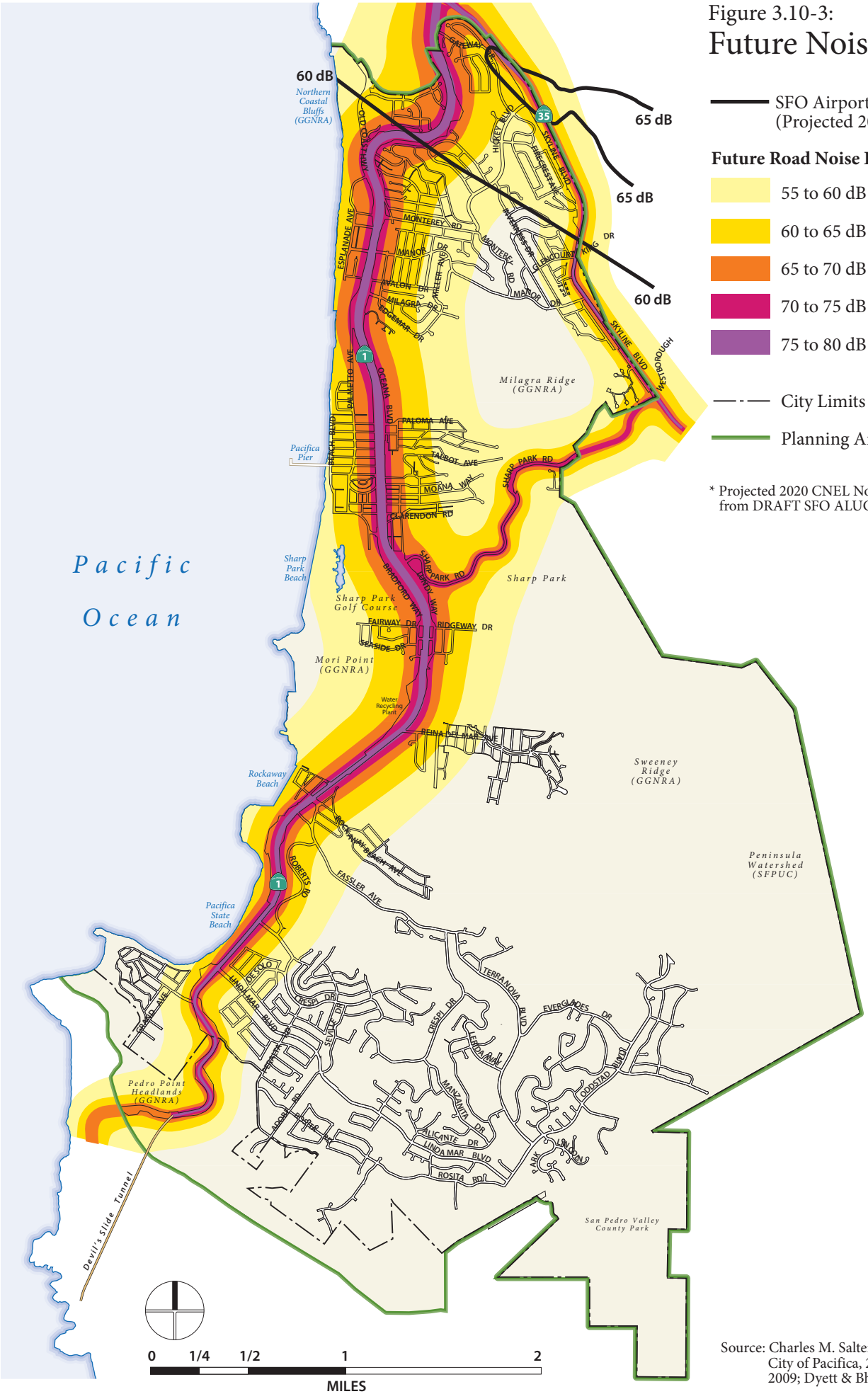
Noise exposure contours for the Pacifica Planning Area were modeled by Charles Salter Associates using the Federal Highway Administration's noise modeling procedure. These noise contours are conservative, meaning that the contours are modeled with minimal noise attenuation by natural barriers, buildings, and other obstacles that reduce noise. The noise level measured at a specific location may be lower than what is shown on the noise map, particularly adjacent to the sections of SR-1 which have physical sound barrier walls installed between the freeway and the city.

IMPACT SUMMARY

New development under the proposed General Plan may temporarily increase noise and groundborne vibration levels due to construction activities. Development under the proposed General Plan would be required to comply with the limitations on construction activity included in Chapter 10 of the Pacifica Municipal Code. Compliance with these provisions and noise polices in the proposed General Plan, is mandatory and will ensure that construction impacts, while potentially a temporary nuisance, are less than significant.

With development under the General Plan, an incremental increase in the amount of land where noise sensitive uses could be subject to community noise levels above normally acceptable levels is expected. However, only a very small amount of land would be subject to "clearly unacceptable" noise levels, while elsewhere noise could be reduced to less than significant levels by state and local building standards supported by proposed General Plan policies.

Figure 3.10-3:
Future Noise



SFO Airport Noise Contours* (Projected 2020)

Future Road Noise Levels

- 55 to 60 dB
- 60 to 65 dB
- 65 to 70 dB
- 70 to 75 dB
- 75 to 80 dB

City Limits

Planning Area

* Projected 2020 CNEL Noise Contour from DRAFT SFO ALUCP, July 2012

Source: Charles M. Salter Associates, Inc., 2009; City of Pacifica, 2008; San Mateo County, 2009; Dyett & Bhatia, 2013.

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IMPACTS AND MITIGATION MEASURES

Impact

3.10-1 New development under the proposed General Plan would not result in a substantial permanent increase in ambient noise levels above levels existing without the project or an increase in noise levels in excess of existing standards in the current Pacifica General Plan Noise Element or Noise Ordinance. (*Significant and Unavoidable*)

Future development within the Planning Area will result in increased traffic volumes, thus increasing noise levels in some areas**.** In 2035, an estimated 1,433 acres or 19 percent of the Planning Area will be within areas with noise levels greater than 60 dB (CNEL). About 381 acres of low and medium density residential land would be exposed to the "conditionally acceptable" 60 to 70 dB range, up from 319 acres today, while 37 acres would have "normally unacceptable" noise, up from 23 acres today. One acre of land in this category would have "clearly unacceptable" noise levels compared to less than half an acre today. Acreage of conditionally acceptable high density and mixed use land would rise from 32 to 42 acres, and land in these categories exposed to normally unacceptable noise levels would increase from 4 to 9 acres. Similar incremental increases in acreage in "conditionally acceptable" and "normally unacceptable" noise exposure would occur for visitor-serving commercial, public facilities, parks, and office uses. These values are the result of conservative modeling assumptions, which incorporate only minimal noise attenuation from natural barriers, buildings, and other noise-reducing features. Actual increases in sounds may be less than the modeled values.

Locating noise-sensitive uses away from high-noise areas (e.g. major transportation routes) and buffering noise levels through design features will help minimize future noise-related land use conflicts. The current Pacifica Noise Ordinance identifies guidelines for noise disruptions in relation to various sources, including vehicle horns and construction-related noise sources. These regulations include descriptions of unlawful, "loud, disrupting, unnecessary, and unusual"[6] noises that could occur within the City from various sources, including vehicle, construction, and other noise disturbances. Although the majority of the noise as a result of buildout under the proposed General Plan will be a result of increased traffic, increases in noise levels from other noise sources are possible. However, the proposed General Plan includes policies that guide noise levels to remain acceptable under buildout.

Table 3.10-2 shows the guidelines for "conditionally acceptable" and "normally unacceptable" noise levels that would be adopted with the proposed General Plan. **Table 3.10-3** shows the existing and proposed totals of acreage with "clearly unacceptable" community noise exposure, based on definitions in **Table 3.10-2**. Areas subject to "conditionally acceptable" and "normally unacceptable" noise levels (per **Table 3.10-2**) can reasonably be reduced to less than significant by state and local building code standards,

[6] City of Pacifica Noise Ordinance, Section 5-10.03.

supported by policies in the proposed General Plan. The total acreage potentially exposed to clearly unacceptable levels is shown in bold, and suggests that the proposed General Plan will increase the number of total acres that are exposed to "clearly unacceptable" noise levels from an estimated two acres today to five acres at buildout. This increase is not considered "substantial." Policies included in the proposed General Plan aimed to reduce the Plan's impact on noise levels within Pacifica help to reduce this potential impact to a less than significant level.

Table 3.10-2: Proposed Land Use Compatibility for Community Noise Environments

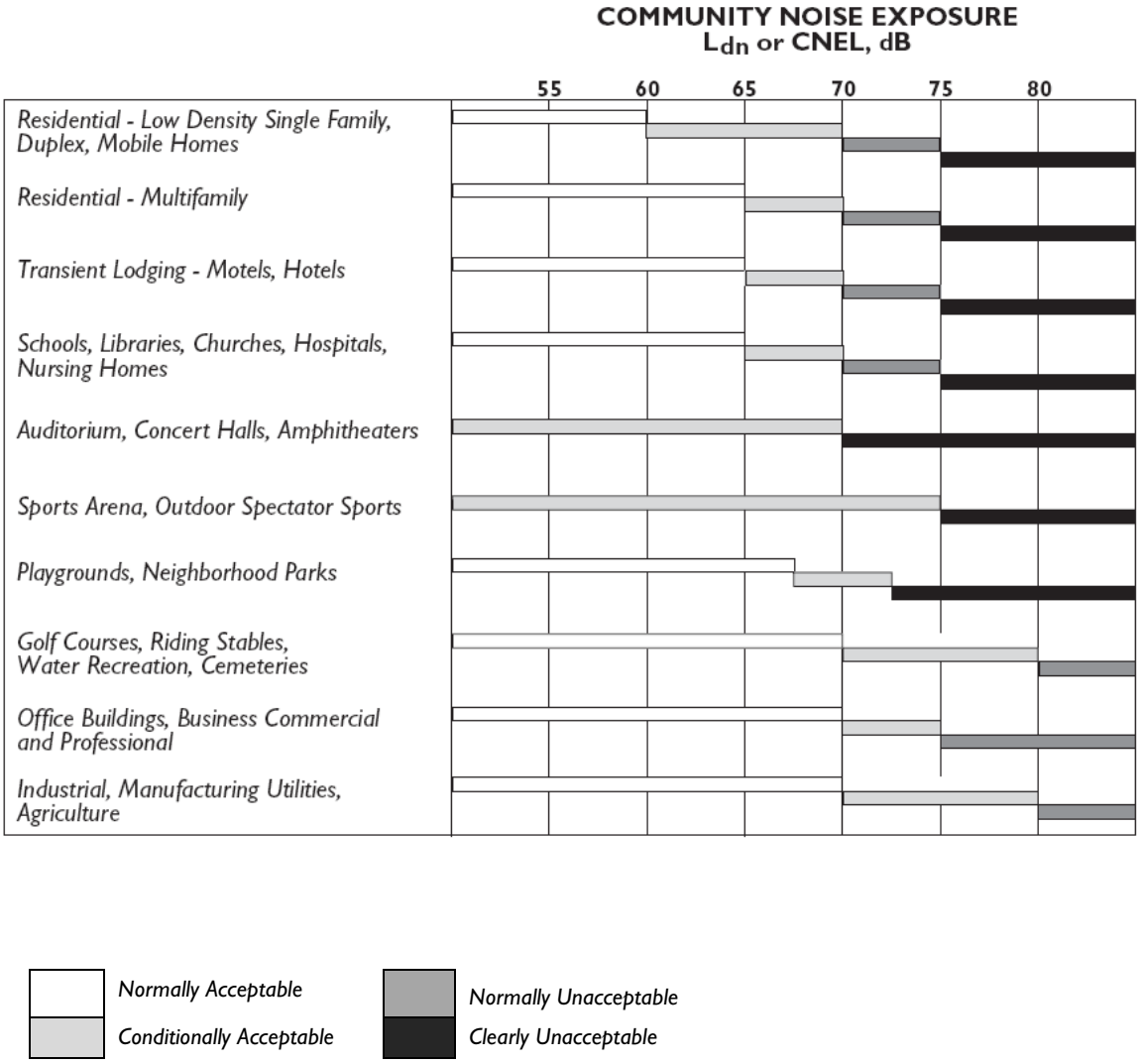

Table 3.10-3: Existing and Proposed Exposure to Noise by General Plan Noise Standards

	Existing Acres			Future Acres		
	Conditionally Acceptable	*Normally Unacceptable*	*Clearly Unacceptable*	*Conditionally Acceptable*	*Normally Unacceptable*	*Clearly Unacceptable*
Low and Medium Density Residential[1]	319	23	0	381	37	1
High Density Residential, Mixed Use[2]	32	4	-	42	9	-
Visitor-Serving Commercial[3]	22	5	1	26	8	2
Public or Semi-Public[4]	36	8	0.1	44	14	0.4
Park[5]	6	-	0	7	-	1
Low-Intensity Visitor Serving Commercial[6]	-	-	-	-	-	-
Office/Commercial[7]	3	-	-	5	-	-
Total Noise-Sensitive Uses	**418**	**40**	**1.9**	**507**	**68**	**4.5**

Source: Dyett & Bhatia, 2013.

Notes:

Definitions of acceptable community noise exposure based on State of California Land Use Compatibility for Community Noise Environments. Standards apply to expected noise-sensitive development types, below.

1 These land use classifications are assumed to be developed with single-family houses, duplexes, and mobile homes.

2 These land use classifications are assumed to be developed with multifamily housing.

3 Transient lodging is expected to be developed in this area.

4 Schools and libraries would be developed in this category.

5 Playgrounds and parks would be developed in this category.

6 Golf courses, ridging stables, water recreation or cemeteries would be expected in this category.

7 Office buildings, business commercial and professional uses would be expected to occur primarily in this classification.

Proposed General Plan Policies that Reduce the Impact

Noise Element

NO-G-1 **Coordination with Other Agencies.** Continue to work with other agencies, airports and jurisdictions to reduce noise levels in Pacifica created by their operations.

NO-G-2 **Acceptable Noise Environment.** Strive to achieve an acceptable noise environment for the environmental, health and safety needs of present and future residents of Pacifica.

NO-G-3 **Sensitive Land Uses.** Protect noise sensitive land uses, such as schools, hospitals, and senior care facilities, from encroachment of and exposure to excessive levels of noise.

NO-I-1 **Community Noise Level Standards.** Use the Community Noise Level Exposure Standards, shown in Table 9-1 in the proposed General Plan, as review criteria for new land uses. Require all new development that would be exposed to noise greater than the "normally acceptable" noise level range to reduce interior noise through design, sound insulation, or other measures.

NO-I-2 **Design Features for Noise Reduction**. Require noise-reducing mitigation to meet allowable outdoor and indoor noise exposure standards in Table 9-2 in the proposed General Plan. Noise mitigation measures that may be approved to achieve these noise level targets include but are not limited to the following:

- Construct façades with substantial weight and insulation;
- Use sound-rated windows for primary sleeping and activity areas;
- Use sound-rated doors for all exterior entries at primary sleeping and activity areas;
- Use minimum setbacks and exterior barriers;
- Use acoustic baffling of vents for chimneys, attic and gable ends;
- Install a mechanical ventilation system that provides fresh air under closed window conditions.

Alternative acoustical designs that achieve the prescribed noise level standards may be approved, provided that a qualified Acoustical Consultant submits information demonstrating that the alternative designs will achieve and maintain the specific targets for outdoor activity areas and interior spaces.

NO-I-3 **Best Available Control Technology.** Require new, fixed noise sources (e.g. mechanical equipment) to use best available control technology (BACT) to minimize noise and vibration.

Noise from mechanical equipment can often be reduced by applying soundproofing materials, mufflers, or other controls provided by the manufacturer.

NO-I-4 **Mechanical Equipment for New Residential Development.** Ensure that building regulations require that noise-generating appliances serving new multi-family or mixed-use residential development are located or adequately insulated to protect residents from the noise.

NO-I-5 **Noise Criteria for City Equipment.** Develop noise criteria for new equipment purchased by the City.

NO-I-6 **Construction Noise.** Continue to limit hours for certain construction and demolition work to reduce construction-related noises.

NO-I-7 **Noise from Highways and Buses.** Work with Caltrans and Sam Trans to mitigate transportation-related noise impacts on residential areas and sensitive uses. This may include encouraging installation of sound barriers or bus stop relocation in selected locations.

NO-I-8 **Airport Noise Disclosure Requirements.** Update the Municipal Code to ensure that special disclosure requirements concerning airport noise refer to the most current CNEL noise contours developed for San Francisco International Airport.

NO-I-9 **Airport Noise Abatement Program.** Continue to work with the airport in improving and implementing its noise abatement program.

NO-I-10 **Residential Sound Insulation Program.** If the airport's federally-approved 65 dB CNEL annual noise contour is mapped within the City, request that the San Francisco Airport's Residential Sound Insulation Program allocate available federal and airport funding to sensitive, noise-affected properties in Pacifica.

NO-I-11 **Noise Ordinance.** Update the noise ordinance to implement General Plan policies and noise standards.

NO-I-12 **Noise Enforcement.** Establish a Noise Abatement Unit made up of members of the Police and other departments to enforce the City's noise regulations, and assign primary responsibility for coordinating overall noise control effort to one City department.

Mitigation Measures

None applicable.

Impact

3.10-2 Implementation of the proposed General Plan would not result in a substantial temporary or periodic increase in ambient noise levels above levels existing without the project. (*Less than Significant*)

Under the proposed General Plan, the most significant source of an increase in temporary or periodic noise levels will be a result of construction noise from development projects associated with buildout of the proposed General Plan. The proposed General Plan does not call for substantial construction projects to take place over the long term, so these increases in noise levels would remain temporary and would not cause substantial increases in noise levels. The extent of temporary or periodic noise levels as a result of construction projects cannot be stated with certainty until development projects are approved. However, as part of environmental review, each construction project will require its own project-level noise analysis to determine potential noise increases for the time-span of the project. These individual analyses will provide a detailed description of potential noise impacts as a result of the project.

In addition, noise from construction projects is regulated under the City of Pacifica Municipal Code (Title 5, Chapter 10), which prohibits the use of pile drivers or other similar equipment between the hours of 8 p.m. and 7 a.m. This section of the Municipal Code, in addition to policies of the proposed General Plan, ensures that temporary or periodic noise increases will not have a significant impact under the proposed General Plan. As a result, this impact is less than significant.

Mitigation Measures

None required.

Proposed General Plan Policies that Reduce the Impact

Noise Element

See NO-I-6, above.

Impact

3.10-3 New development under the proposed General Plan would not cause the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. (*Less than Significant)*

Vibration is generally a result of railroad traffic on a large scale, and can also occur from heating and air conditioning systems, door slams, foot traffic, nearby construction activities, train operations, and street traffic. Blasting, pile driving, vibratory compaction equipment, and heavy tracked vehicles are known to cause the highest vibration levels, followed by

commuter rails and rapid transit systems.[7] The proposed General Plan does not call for heavy construction to take place that could bring in heavy machinery or vehicles that would cause vibration. In addition, there are neither planned commuter rails nor rapid transit lines that would run through Pacifica, and therefore there would be no contribution to groundborne vibration or noise levels from these sources. This impact is therefore less than significant.

Proposed General Plan Policies that Reduce the Impact

Noise Element

See NO-I-3, above.

Mitigation Measures

None required.

Impact

Impact

3.10-4 Implementation of the proposed General Plan would not expose people residing or working in the project area to excessive noise levels as identified in an airport land use plan. (*Less than Significant)*

The greatest potential for noise intrusion from airports occurs when aircraft land, take off, or run their engines while on the ground. San Francisco International Airport (SFO) is located approximately four miles east of the Planning Area. Noise contours developed for SFO show noise levels elevated above 60 dB extending over approximately 117 acres in the northeastern corner of the Planning Area, in the Fairmont neighborhood, including 88 acres of residential land. Under the proposed General Plan, airport noise is projected to increase so that by 2020 an estimated 251 acres in Pacifica, including 175 acres of residential land, would experience aircraft noise levels above 60 dB.[8] No part of the Planning Area is currently within the 65 dB CNEL noise contour. By 2020, the 65 dB contour is expected to affect eight acres of the Planning Area, including 5 acres of residential land. This contour is the current eligibility threshold for noise-affected sensitive uses to receive funding through SFO's Residential Sound Insulation Program.

SFO's Aircraft Noise Abatement Office maintains a noise abatement program that integrates parts of the approved Noise Compatibility Plan; City and County of San Francisco resolutions; stated goals of the San Francisco International Airport/Community Roundtable; and air traffic control requirements. The program includes a mix of regulatory and voluntary

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[7] County of San Mateo, North Fair Oaks Community Plan Update Draft EIR, August, 2011.

[8] SFO Interactive Community Noise Map Application, Quarterly Contours 3rd Quarter 2007, accessed at http://www.flyquietsfo.com/mapping_tools.asp, June 11, 2012.

actions that together minimize the impacts of noise on communities while ensuring safety. This program, together with existing regulations supported by proposed Plan policies, would reduce the potential impact of conditionally acceptable noise levels to a less than significant level.

Proposed General Plan Policies that Reduce the Impact

Noise Element:

Policies NO-I-15, NO-I-16, and NO-I-17, as listed under Impact 3.10-1, will reduce potential impacts under the proposed General Plan from airport noise.

Mitigation Measures

None required.